

collection of plants was described by our friend the late Dr. Glehn.

Next year, Polyakoff made another little journey to the upper Irkut valley, from which he returned with something quite new—namely, a rich collection of stone implements. There he studied the actual position of the encampments of our Stone-Age ancestors, and the general surroundings of their life. Afterwards, wherever Polyakoff went—to Olonetz, on the Volga, on the Ural, or to Saghalien—he had only to take a short walk in the region he proposed to explore to have a general idea of it. Then he took a shovel, or invited somebody with a shovel, and indicated the place where some digging ought to be done, and stone implements (Neolithic) never failed to be found. His collections are as numerous as invaluable.

In 1868, he entered the St. Petersburg University—without some difficulties on account of the Latin examinations—and the late Dean of the University, the much-regretted Prof. Kessler, at once perceived that he would have in Polyakoff a first-rate naturalist, and showed him much attention. Polyakoff's thesis for the degree of Doctor of Sciences—a monograph on the cartilaginous fishes—received high praise, and as soon as he was out of the University, he was appointed Conservator of the Zoological Museum of the Academy of Sciences at St. Petersburg.

After that time Polyakoff was almost always out on some expedition sent either by the Academy or by the Geographical Society. He explored the Olonetz region, the middle Volga, the lower Obi region, and recently he was sent by the Academy of Sciences on a long exploring journey to Saghalien and the Pacific littoral. It was on his return from this last journey that he fell ill at St. Petersburg, where he died in a hospital. A friend who learned of his illness, and went to visit him at the hospital, came too late.

His death is the more a loss for science, as he was going to work out in detail the exceedingly rich zoological and anthropological materials which he had collected during his last journeys. Only preliminary reports of these journeys have been published. Part of his researches on the Stone Age have been embodied in Count Uvaroff's work; others have appeared in the publications of the Academy of Sciences, the Russian Geographical Society, and the St. Petersburg University Society. His preliminary report on the Obi journey (containing an admirable description of the Ostiaks, whom he thoroughly understood) has been translated into German; and there is also a German rendering of his preliminary report, or rather letters, on Saghalien. But most of his observations remain unpublished. It is even doubtful whether his field note-books contain all his observations and generalizations, and whether they were kept in such a state as to render publication possible.

In zoology, Polyakoff's name will remain associated with the description of the *Equus prjevalski*, a separate species established by him, which is the real ancestor of our common horse, discovered by Prjevalski in the Alashan Mountains of Central Asia.

NOTES.

THE dinner given to Prof. Tyndall is going on at Willis's Rooms as we go to press. The hosts number more than two hundred, and many of the most eminent men in the country are present.

ON April 12, 1886, the Local Government Board appointed a Committee to inquire into the efficacy of M. Pasteur's treatment of hydrophobia, and into any dangers which might be connected with its employment. The Committee consisted of Sir James

Paget, Dr. Lauder Brunton, Dr. Fleming, Sir Joseph Lister, Dr. Quain, Sir Henry Roscoe, and Prof. Burdon Sanderson, with Prof. Victor Horsley as Secretary. Dr. Lauder Brunton, Sir Henry Roscoe, and Dr. Burdon Sanderson, with the Secretary, visited Paris in order to study M. Pasteur's methods; and after their return Prof. Horsley conducted a series of experiments with a view to the settlement of certain points about which he and his coadjutors had felt some doubt. A copy of the Report of the Committee has been sent to the *Times*, and it appears that the Committee unanimously express confidence in M. Pasteur's system.

THE sixteenth meeting of the French Association for the Advancement of Science will be held at Toulouse from Thursday, September 22, to Thursday, September 29 next. Notice of intention to be present at the meeting should be given to the Secretary of the Association, 4 Rue Antoine-Dubois, Paris, before July 15.

THE *Evening Standard* of Tuesday is our authority for the statement that addresses from the Church of Ireland, the Metropolitan Board of Works, the *Royal Society*, and the Ancient Order of Foresters, were presented to the Queen on Monday last. Let us hope that this is not true.

THE third annual general meeting of the Marine Biological Association took place on Friday last in the rooms of the Linnean Society, Burlington House. Prof. Flower presided, and among those present were Mr. Thiselton Dyer, Mr. Crisp, Prof. Bell, Prof. Charles Stewart, Prof. Ray Lankester, and Sir John Staples. The report for the past year stated that the Council had devoted attention chiefly to the superintendence and fitting of the laboratory at Plymouth, and to preparations for the work of the Association in connexion with that laboratory. It is expected that the laboratory will be ready for partial occupation in the present summer, but the tanks and circulation of seawater cannot be completed for some months to come. The Council had decided to issue a journal, which might serve not only for the circulation of the official publications of the Association, but also as a means of inquiry and exchange of information among those who are interested in marine biology in its relation to the sea fisheries of the United Kingdom. A first-rate biological library was one of the most important appliances which the Marine Biological Association must possess in its Plymouth laboratory. The Council trusted that the members and friends of the Association would assist in the formation of such a library by gifts of books. The Association was willing and anxious to co-operate with individuals or associations in any part of the British Islands who were engaged in the study of the natural history of marine fishes or in researches in marine biology. The Council had to record with deep regret the death of one of the vice-presidents of the Society, Mr. George Busk. Some formal business having been despatched after the adoption of the report, the meeting concluded with a vote of thanks to the chairman for presiding.

A SPECIAL general meeting of the Fellows of the Royal Horticultural Society was held on Tuesday "to consider the results of the negotiations and inquiries which have been made by the Council as to the future maintenance and housing of the Society." Sir T. Lawrence, who presided, said the Council thought it would be wise as soon as possible to carry on their operations at Chiswick; and this view met with general approval. The meeting adopted a resolution requesting the Council to take such steps for the housing and maintenance of the Society as might appear best calculated to preserve its character and utility and promote the horticultural interests committed to its charge, and insisting upon the importance of

immediately taking steps to secure accommodation for the Society at the close of the year, either of a permanent or temporary character, in some central situation in or near the City.

ON Jubilee Day the Royal Gardens, Kew, were visited by 31,000 people.

THE *Meteorologische Zeitschrift* for June contains the first part of a comprehensive discussion by Dr. W. Köppen, of the Deutsche Seewarte, on the nomenclature of clouds. The author asks whether the same cloud seen from different sides should receive different names; for instance, when seen from the front, sideways, from behind, above, or below; or, whether the classification should refer generally to the properties observed in a particular cloud, especially as regards its density and dimensions. The *apparent* form plays an important part in Poey's classification, but Dr. Köppen shows that it sometimes leads to erroneous conclusions. The classifications of Hildebrandsson, Ley, Weibach, and others, receive especial notice, but no reference is made in this first article to Mr. Abercromby's recent researches.

THE Editorial Committee of the Norwegian North-Atlantic Expedition (1876-78) have published the eighteenth volume of their General Report (Christiania, 1887, pp. 209 and 48 plates). The memoir in question has been edited by Prof. H. Mohn, Director of the Meteorological Institute at Christiania, and deals especially with the depths, temperature, and circulation of the North Ocean, and to some extent with the winds and atmospheric pressure. The region embraced lies between Iceland and Norway, and extends northwards as far as Spitzbergen. The currents naturally receive much attention, and Prof. Mohn states that he has sought to explain the motion of the water as produced alike by the normal winds and by the difference in the density of the water; and he points out that, while the former cause predominates, the latter too has full significance. The maps are very clear, and the explanatory text is written both in Norwegian and English, as in the previous volumes.

THE first of the vessels of the Norwegian seal-hunting fleet have returned to Hammerfest from the Arctic regions, and the captains report that the ice-belt this spring extended far south of Spitzbergen. It appears from their reports that when they left the ice-fields no vessels had succeeded in reaching that island. Seals were very plentiful, and nearly all vessels have full cargoes.

THE three courses of Burnett Lectures on "Light," delivered by Prof. G. G. Stokes at Aberdeen in 1883, 1884, and 1885, have now been issued in a single volume belonging to the well-known "Nature Series." As we had something to say about each of these courses at the time of its publication in a separate volume, we need only remind our readers that the first course deals with the nature of light, the second with light as a means of investigation, the third with the beneficial effects of light. On this last subject, Prof. Stokes says in the preface to the new volume:—"The benefits derived from light, which form the subject of the third course, are, it might have been supposed, too obvious to require mention. Yet few, perhaps, have been in the habit of contemplating these benefits as a whole, or have perceived how far-reaching and of what vital importance are the advantages that we derive from light, if we include in that term not merely what the eye can perceive, but all that in its physical nature differs from visible light only in the way in which light of one colour differs from that of another colour."

THE "Queen's Jubilee Atlas," which we have received from Messrs. George Philip and Son, contains an excellent series of maps, those relating to the British Empire being especially good. Each map is accompanied by a short explanation, with descriptive and historical notes and statistical tables. A physical map of

England is given showing the coal-fields and the heights of all the mountains; this is followed by three separate maps of the British Isles showing the railways alone.

MESSRS. GEORGE PHILIP AND SON have also issued a "Handy-Volume Atlas of the World," containing 110 maps and plans, with complete index, and statistical notes, by Mr. J. F. Williams. The little volume has been carefully prepared, and is the first of a series designed to present all essential geographical information in a handy and accessible form.

AMONG recent publications in Paris we notice the "Éléments de Médecine suggestive" of MM. Fontan and Ségard, in which the authors give numerous illustrations of the effects of hypnosis in disease, whether mental or physical; a pamphlet, by Dr. Servier, on the Val de Grace, the military hospital in Paris, comprising the history of the buildings and of the institution; and a book by M. Ed. Dreyfus-Brisac, on "L'Éducation nouvelle," a series of studies well worth the attention of those who take some interest in the present evolution of public spirit concerning educational matters in France.

M. G. PRUVOT, *maître de conférences* in the Sorbonne, has recently issued a course of lectures on "Worms and Arthropoda." The lectures were delivered by him in 1885-86. The work is profusely illustrated.

THE *Archives Slaves de Biologie*, a periodical containing only Slavonic work in biology, are publishing a long series of papers by Danilewsky on the Hæmatozoa of Reptiles and Birds.

A FULL account of the New Zealand Industrial Exhibition, 1885, is presented in an Official Record, a copy of which has been sent to us. The facts are brought together in a way that will facilitate comparative study of the progress of the colony in the various arts and manufactures, and the volume will be of service to those who may undertake to organize any future exposition of the industrial resources of New Zealand.

AN elaborate synopsis of the North American Syrphidæ, by Dr. Samuel W. Williston, has been issued as the thirty-first Bulletin of the United States National Museum. Dr. Williston explains that he has given especial attention to this family since he began his dipterological studies eight years ago, and that he has collected a large part of the species either in New England or in the West. The types of all but two or three of the new species described by him, together with his entire collection in this family, will be preserved in the National Museum for future reference and revision.

THE Manchester Microscopical Society has just issued its Transactions and Annual Report for 1886. The volume contains a valuable address on "Fresh-water Animals," by the President, Prof. A. Milnes Marshall, F.R.S., and papers and communications read by the members. A short paper by Mr. Robert Parkes may, perhaps, suggest to some readers a pleasant way of spending a few of the approaching holidays. In this paper Mr. Parkes describes a dredging excursion he made some time ago to Lamlash Bay, Isle of Arran, in company with two friends. The excursion was very successful, and Mr. Parkes was able to exhibit to the Society some of the specimens he had secured. He assured the members that dredging was not a very expensive pursuit, to be followed only by the use of steam launches and a large staff. They could see by the collection before them that good results might be obtained by two or three joining together and dredging from an ordinary rowing-boat.

THE fifth volume of the Journal of the Liverpool Astronomical Society has just been issued. It contains many papers, notes, and reviews, and has some good illustrations.

By permission of the President and Council of the Royal Astronomical Society, the annual general meeting of the Liver-

pool Astronomical Society will be held at Burlington House, London, on Friday, July 8.

THE problem of protection against yellow fever by inoculation seems in a fair way to solution by the Brazilian doctor Freire, who has been seven years at work on the subject. According to a recent account, the number of persons already inoculated is 6524. There died from yellow fever in Rio de Janeiro, between January 1885 and September 1886, 1675 persons, of whom eight had been inoculated (in 1884, the method being then imperfect). This gives a mortality of about 1 per 1000 for the inoculated, and 1 per cent. for the uninoculated. It is remarkable that there has been no epidemic of yellow fever in Rio de Janeiro this year (a thing not known for the last thirty-five years). The microbe of yellow fever is called *Cryptococcus xanthogenicus*. Dr. Freire gets a culture liquid for inoculation, on the principles of M. Pasteur's methods, and he injects about one gramme of it subcutaneously.

EXPERIMENTS have been recently made by S. Leone (*Gazzetta Chimica Italiana*) as to how organic substances in water are affected by development of bacteria. He used distilled water, to which a little gelatine was added. The organic nitrogen and carbon are changed by the organisms into inorganic compounds, chiefly carbonic acid, ammonia, nitrites, and nitrates. It appears that up to the fifteenth or sixteenth day the ammonia steadily increased, then it decreased till it was quite gone. Meanwhile, nitrous acid appeared; it increased as the ammonia disappeared, and when this was gone, a formation of nitric acid began, at the cost of the nitrous acid, so that in thirty-five days the latter too was quite gone, and only nitric acid present. If a little gelatine was put in the water which had turned ammonia into nitrates, the reverse process began; ammonia was formed again, and even directly added nitrate was changed into this. If no fresh gelatine was added, however, nitrites and nitrates were again produced. The author ascertained that the same organisms that in presence of organic substances formed ammonia, in absence of such effected nitrification.

PROFS. KRUSS AND NILSON, of Stockholm, have succeeded in preparing a double fluoride of potassium and the new element germanium, K_2GeF_6 , isomorphous with the corresponding double fluoride of ammonium and silicon, thus proving most conclusively that this recently discovered element belongs to the silicon, titanium, zirconium, tin, and lead group of the periodic classification. The fluoride of germanium, GeF_4 , which is not gaseous, but resembles zirconium fluoride, ZrF_4 , was first prepared by dissolving the oxide, GeO_2 , in hydrofluoric acid; and the double fluoride separated in the gelatinous form on adding the calculated quantity of potassium fluoride. On filtering, however, the salt dried to a crystalline powder resembling potassium silicofluoride, but being more soluble than the latter, separated from solution in hot water in beautiful tabular crystals, and from a solution in cold water on evaporation over sulphuric acid in pyramid-capped prisms several millimetres long. Once more the value of Newlands' and Mendelejeff's generalization as an incentive to research is demonstrated, and confidence in its truth inspired, for Mendelejeff himself predicted that "ekasilicon will yield a double fluoride isomorphous with the double fluorides of silicon, titanium, zirconium, and tin, of greater solubility than that of silicon; and the fluoride, like the fluorides of titanium, zirconium, and tin, will not be gaseous."

A NEW synthesis of uric acid, directly proving its constitution, has been effected by Prof. Horbaczewski (*Monatshefte für Chemie*, May 28, 1887). The reaction is very simple and consists in fusing together 1 part of trichlor-lactamide, $CCl_3-CHOH-CO-NH_2$, with 10 parts of urea, $CO(NH_2)_2$, when 15 per cent. of uric acid together with am-

monium chloride, hydrochloric acid, water, and a few decomposition products are obtained. By a long process of separation and purification the uric acid was obtained quite pure, in crystals exactly resembling those obtained from natural sources. This method of synthesis points to the extreme probability that the constitution assigned by Medicus to uric acid is correct, and shows that it is the di-ureide of acrylic acid. Probably no work has been watched with keener interest than the attempts which have been from time to time made to solve the problem of the constitution of this complex molecule, and it is a matter of great satisfaction to have our knowledge of a substance so widely occurring in animal secretions, and parent of so many derivatives, founded upon a method of synthesis so direct.

SUPERFICIAL tension in liquids being, like the magnetic state, an essentially molecular phenomenon, we might expect that it and phenomena depending on it would be modified by action of an intense magnetic field. Prof. Dufour lately proved such an effect by making mercury flow through a horizontal capillary tube placed between the poles of a strong electro-magnet. The liquid describes a parabola, the vein being continuous to a certain distance from the orifice, when it separates into drops. While the magnet acts the parabola is stretched, and the continuous part of the vein lengthens, indicating more rapid flow.

ATTENTION has been lately called by Herren Kerner and Wettstein, in the Vienna Academy, to two carnivorous plants found in Germany. One of these is the leadwort root (*Lathræa squamaria*) which has no chlorophyll, and passes for a parasite, as it fixes, with small nipples, on the roots of fruit-trees. The pale stems, appearing in shady moist places in spring, are covered thickly with scale-like leaves, each of which has its upper half rolled back on the back of the lower, leaving a hollow space between. Into this open by small holes from five to thirteen separate chambers, having on their surface numerous tufted hairs and hemispherical horns connected with the vascular bundles. Various small animals get into these chambers, and ere long disappear. From both hairs and horns threads of plasma stream out, when the animals come into contact with them, and lay hold of them. Though it is not exactly proved that the plant benefits by the animals it thus catches, this seems very likely from its general character. It is more remarkable that a plant containing chlorophyll, and existing independently, like *Bartsia alpina*, should have similar organs for capture of animals, and should feed on such, as the authors assert. The plant forms in autumn underground buds covered with scales, whose lateral borders are rolled outwards, making a hollow in which are organs quite similar to those in the leadwort root.

THE habits of the rainbow trout (*Salmo irideus*) in their fry stage are in some respects very different from those of other species of Salmonidæ. At the present time many thousands of them may be seen in the ponds belonging to the National Fish-Culture Association at Delaford Park, where they were hatched out in the spring from ova sent from California. Instead of moving about in groups or shoals, they isolate themselves from one another, and are to be found in every part of the pond instead of at certain spots or on shallows. Again, the rainbow trout fry are visible within half a foot of the surface of the water, while other varieties hide from view. They appear to be exceedingly voracious, and this may account for their capacity for rapid growth, which exceeds that of their congeners.

IN one of the Selborne Society Letters, issued the other day, the Rev. S. A. Preston, the founder and for many years the President of the Marlborough College Natural History Society, sets forth his ideas as to the best method of promoting the study of natural history in schools. He thinks (1) that each boy should have the elements of two or three branches of natural

history put before him,—as a general rule, nothing more than the elements would be required; (2) that this should be done so as to make it as interesting to him as possible, so that he may look forward to his natural history lesson; (3) that if he “takes” to any particular subject, means should be at hand to enable him to go on with it; (4) that he should be encouraged to work out of school. Mr. Preston is of opinion that the appointment of “science masters” is not necessary for the attainment of these ends. “Among any body of masters now,” he says, “there are sure to be some who are fond of some branch of natural history, and who can teach the elements of their subject (as far as is necessary for boys in general), and do it in a pleasing and interesting manner. At the end of a long afternoon’s work at regular school subjects, the master should occupy the last half-hour or so (if the other lessons have been well said) with a discussion upon his special branch, showing specimens, encouraging questions, and making this part of his work as different as possible from the ordinary work. Boys will look forward to this time, and will work all the harder at their other work to get this ‘talk,’ if a good lesson is required before the natural history one. By the end of a term, with a little system, the elements of the subject may easily be learnt. The next term, masters should change forms for this half-hour, and the boys thus have some new subject put before them. In a few terms, therefore, a very fair general knowledge of natural history may be secured. If a boy showed any aptitude in any one branch, there would be a master at hand ready to help him and get him on.”

MR. C. S. WILKINSON, the New South Wales Government Geologist, reporting upon the seams of coal pierced in the diamond-drill bore at Holt-Sutherland, near Sydney, says that in this bore a depth of 2307 feet from the surface, or 2175 feet below sea-level, has been attained. This is the deepest diamond-drill bore in Australia. The diameter of the bore to a depth of 500 feet is $3\frac{1}{2}$ inches, and below that depth it is 3 inches. The strata passed through consist of Hawkesbury sandstones, 653 feet 6 inches; shales, sandstone, and conglomerates (the upper 314 feet consisting chiefly of chocolate-coloured shales), 1573 feet 3 inches; upper seam of coal, 4 feet 2 inches; shales, sandstone, and conglomerate, 65 feet; lower seam of coal, 5 feet 3 inches; black shaly sandstone, 5 feet 11 inches.

A HEAVY snowstorm is reported to have occurred on the Scheekoppe on June 11. On the Kapellenberg, between Hirschberg and Schönau, it snowed severely, and in the night the thermometer sank to 3°.

A TELEGRAM from Omsk to St. Petersburg of the 21st inst. states that there were several slight oscillations of the ground at Vernoe on that day. To the west of Karakoul the earthquake had been more violent than at the latter place; a lake in the neighbourhood had sunk 3 feet. Almost all the Government buildings at Vernoe are said to be destroyed.

Two beaver colonies have just been discovered at Amlid, near Christiansand, Norway. On the bank of a river the beavers have made lodges of branches of trees, which are held together with clayey mud, the whole resting on logs of wood. The entrance, a hole, faces the river, but is below the surface of the water. Round the entrance there are numbers of aspen and birch trees, the bark of which has served as food for the animals. The beaver gnaws the tree about 2 feet from the root, and if it finds the bark to its taste, cuts the tree up in pieces from 2 to 3 feet in length, which the animal then drags or carries down to its house proceedings which are fully demonstrated by the many “log-runs” in the woods along the river bank. Observers have also noticed another remarkable habit of this interesting animal, viz. that on arriving by the water-side with such a log of wood it will poise the piece on the back of its neck and swim with it right into the lodge, where the bark is gnawed off and

stored away for winter use. This accomplished, it will shoot the log into the river. The largest trees the animals have dealt with in this manner are 11 inches in diameter. The colonies are situated far from human dwellings, where people only come in winter, during the timber-felling season.

AT the Ladies’ Soirée at the Royal Society on June 8, much attention was attracted by the fine exhibit sent from the Royal Gardens, Kew. Great credit is due to the officials at Kew for the care with which the objects were selected and displayed. The following is a list of the flowering plants:—*Myrmecodia Beccari*, *Myrmecodia* sp. New Guinea, *Leea amabilis*, *Impatiens Hawkeri*, *Primula Reidii* and *cortusoides*, *Piper porphyrophyllum*, *Streptocarpus Dunnii* and *polyanthus*, *Coffea liberica*, *Tillandsia splendens* and *usneoides*, *Caraguata Zahnii*, *Cypripedium Stoneii*, *Dendrobium Dalhousieanum* and *transparens*, *Epidendrum vitellinum*, *Odontoglossum Hallii*, *Miltonia vexillaria*, *Sarracenia Patersoni*, *Palumbina candida*, *Areca monostachya*, *Licuala grandis*, *Verschaffeltia splendida*, *Caryota Blancoi*, *Cycas undulata*, *Hemitelia Smithii*, *Adiantum amabile*, *Acrostichum crinitum*, *Brainea insignis*, *Saccolabium curvifolium*. There were cut flowers of *Hæmanthus magnificus*, *Randia Stanleyana*, *Hexacentris mysorensis*, *Senecio macroglossa*, *Iris Susiana*, *Chamaedorea elegantissima*, *Bougainvillea spectabilis*, *Napoleona imperialis*, *Cochlostema Jacobianum*, *Pandanus odoratissimus* (cone), *Musa coccinea*.

THE additions to the Zoological Society’s Gardens during the past week include a Moustache Monkey (*Cercopithecus cephus* ♀) from West Africa, presented by Mr. Bernard Lawson; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. G. Choutte; two Lions (*Felis leo* ♂ ♀) from Kittywar, Guzerat, India, presented by Major J. Humphrey; two Striped Hyænas (*Hyæna striata*) from India, presented by the Bombay Natural History Society; a Suricate (*Suricata tetradactyla*) from South Africa, presented by Mrs. H. A. Warwood; an Australian Crane (*Grus australasiana*) from Australia, presented by Mrs. M. S. Richman; a Ring-necked Parrakeet (*Palæornis torquatus*) from India, presented by Mrs. Crabtree; two Edible Frogs (*Rana esculenta*), European, presented by Mr. H. A. Crossfield; three Green Turtle (*Chelone viridis*) from Ascension, presented by Capt. C. Theobald, R.N.; a European Pond Tortoise (*Emys europæa*) from Venice, presented by Mr. Alban Doran; an Alligator (*Alligator mississippiensis*) from Florida, presented by Mr. Hugh Bellas; a Green Monkey (*Cercopithecus callitrichus* ♂) from West Africa, five Common Dormice (*Muscardinus avellanarius*) British, deposited; a Little Egret (*Ardea garzetta*), a Buff-backed Egret (*Ardea russata*), European, a Horrid Rattlesnake (*Crotalus horridus*) from Brazil, purchased; a Yak (*Poëphagus grunniens*), born in the Gardens.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 JULY 3-9.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on July 3.

Sun rises, 3h. 50m.; souths, 12h. 3m. 53'0s.; sets, 20h. 17m.; decl. on meridian, 22° 59' N.; Sidereal Time at Sunset, 15h. 3m.

Moon (Full on July 5) rises, 18h. 22m.; souths, 22h. 48m.; sets, 3h. 11m.*; decl. on meridian, 19° 4' S.

Planet.	Rises. h. m.	Souths. h. m.	Sets. h. m.	Decl. on meridian.
Mercury ...	6 11 ...	13 52 ...	21 33 ...	18 12 N.
Venus ...	7 55 ...	15 11 ...	22 27 ...	13 54 N.
Mars ...	2 30 ...	10 49 ...	19 8 ...	23 46 N.
Jupiter ...	13 35 ...	18 53 ...	0 11* ...	8 56 S.
Saturn ...	4 57 ...	12 59 ...	21 1 ...	21 25 N.

* Indicates that the setting is that of the following morning.